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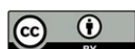
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Effect of social media advertisements on the treatment decisions of patients for veneers and lumineers, patient perspectives: A cross-sectional study

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ABSTRACT

Aims: The study objective was to assess the association between social media advertisements related to veneers and lumineers and the treatment decision made by the patients. **Methods:** This study was carried out in Riyadh, Saudi Arabia from January to June 2021 using a convenient sampling technique with 220 participants. Patients receiving treatment in public hospitals, who have been exposed to social media advertisements on dental veneers and Lumineers, were included. The questionnaire focused on the person's usage of social networking sites, factors influencing the plum for treatment of veneers or Lumineers, and whether the advertisements on social media influenced their decision for a particular treatment. **Results:** The respondents were predominantly female (83.6%), between 25 and 34 years of age (36.4%), and from the Central Region (84.1%) of Saudi Arabia. The majority of the sample (72.3%) spent more than 2 hours daily on social media. Moreover, 33.2% used 3 social media platforms. A significant association was found between the hours of exposure to social media and the likelihood of considering that social media influenced the request for veneers and lumineers ($p=0.034$). However, the association was not significant for the group who already had veneers or lumineers ($p=0.199$). The association between the tendency to seek veneers or lumineers when the advertisers were dental professionals was significant ($p<0.001$). **Conclusion:** Social media had a significant influence on the tendency to seek veneer and lumineers treatments and the type of social media influencer had a significant effect on this tendency.

Keywords: social media, patient perspective, cosmetic dentistry, marketing, advertising

1. INTRODUCTION

Social media is known as a powerful tool that enables users to communicate, share content, exchange information, and advertise through social networking (Fuchs, 2017; Theobald et al., 2006; Kasemy et al., 2021). It has become an indispensable source of patient information. It is estimated that 37% of the adults in America use social media to obtain health and healthcare-related information, moreover, a marketing strategy for dental practices (Henry et al., 2012). Main stream social networking sites include Facebook, Snapchat, Twitter, Instagram, YouTube, LinkedIn, WhatsApp, and the different social media sites that are continuously expanding in size and usage (Golder et al., 2017). Due to the increase in social media utilization in recent years, healthcare providers and healthcare organizations began to create accounts on various platforms to advertise or market their services (Ventola, 2014). Similarly, Saudi dental clinics used social media platforms to advertise. Advertisements are devised to share deals and promotions, showcasing positive patient outcomes, and first-hand communication with patients (Elrod and Fortenberry, 2020).

Cosmetic dentistry has become a popular patient request due to the increased availability of information in the media and on the internet. The most requested procedures are veneers (54.8%) and teeth bleaching (77.8%) (Theobald et al., 2006). Porcelain veneers are aesthetically thin shells of porcelain that are applied directly to tooth structures, to ameliorate the aesthetics (El-Mowafy et al., 2018). The application of porcelain veneers in dental practice includes improvement of stained teeth, fractured teeth, caries in the labial surface, diastema closure, and a minor misalignment of anterior teeth. Another popular restorative treatment is lumineers, which, unlike veneers, are applied without sound tooth structure impairment and require a very thin thickness of the restorative material (Mitthra et al., 2020). According to clinical studies, lumineers can last for 10 years or longer if they are kept in a hygienic oral environment (Mitthra et al., 2019).

Literature states that a vast number of patients rely heavily on social networking to obtain knowledge related to dental health (Van de Belt et al., 2013) and treatment, particularly cosmetic dentistry (Alfouzan et al., 2018). Cyberspace is a dominant source of health-related information (Cline and Haynes, 2001). A substantial number of patients chose their dentists based on their social media accounts (Alalawi et al., 2019). However, there is limited literature regarding the effects of social media advertisements on patients' treatment decisions. This study was designed to evaluate the association between social media advertisements related to veneers and lumineers and the treatment decision made by patients.

2. MATERIALS AND METHODS

This study was carried out in the city of Riyadh, Saudi Arabia. Institutional Review Board approval was gained from King Abdullah International Medical Research Center (Study number: RC20/331/R). A cross-sectional study design and a convenient sampling technique were used. The inclusion criteria were patients receiving treatment in public hospitals in Riyadh, with a history of exposure to social media advertisements of veneers and lumineers and were able to complete the self-administered questionnaire. The study period was from January to June 2021.

A structured, self-administered questionnaire was developed. The questionnaire was translated to Arabic and back-translated to English to ensure accuracy. The face validity, construct validity, and feasibility, of the questionnaire, were established before the study. The survey was pretested on a pilot group of 30 participants before distribution to ensure question clarity and overall acceptability of the survey. Minimal corrections were made in response to the feedback obtained from the pilot group. The reliability coefficient alpha recorded was 0.7.

The questionnaire assessed several socioeconomic and demographic factors, including age, gender, and region of residence within Saudi Arabia, nationality, educational level, and monthly income. The rest comprised of questions related to their exposure to treatment with veneers or lumineers, and whether the social media advertisements influenced their choice of a specific treatment. For the sample size estimation, because there were no prior values for the proportions to be estimated, we conducted a pilot study with 30 patients to obtain the proportion influenced by social media for the veneer/lumineers treatment, required for the sample size calculation. The sample size was determined using a single proportion formula, by using a 95% confidence interval, an expected prevalence of 83% from the pilot study, and a precision of 0.05. The recommended sample size was 217 (Dhand, 2014). The questionnaire was developed with survey monkey. The method of distribution and promotion of the questionnaire was through various social networks including Twitter®, and cell phones through the WhatsApp® application. All were used to increase the distribution rate. Participants' informed consent was gained at the outset of the study.

The data were entered in an Excel spread sheet and analyzed using SPSS (Statistical Package for Social Science), Version 25.0 for Windows. Descriptive analysis was done to present an overview of the findings. The categorical variables are described as frequency (n) and percentage (%), and the continuous variables as a mean and standard deviation (SD). A Pearson's chi-squared test (or Fisher's exact tests for smaller samples) and p-values were utilized to analyze the independence of various variables by the

exposure to social media. Logistic regression analyses were computed to determine the associated demographic characteristics for the tendency to choose veneers or lumineers based on the influence of social media. A p-value < 0.05 was statistically significant.

3. RESULTS

A total sample of 220 participants from different regions in Saudi Arabia completed the questionnaire. The respondents were predominantly female (83.6%), between 25 and 34 years of age (36.4%), and from the Central Region (84.1%) of Saudi Arabia just more than a half had a bachelor's degree (65.5%) and 32.3% had a monthly income of less than 3000 SAR. Table 1 displays the descriptive statistics of the sample.

Table 1 Frequency Distribution of the Characteristics of the Sample

Sample Characteristics	Frequency (n=220)	%
Age		
18-24	76	34.5
25-34	80	36.4
35-44	25	11.4
45-54	22	10.0
55-64	14	6.4
65+	3	1.4
Gender		
Female	184	83.6
Male	36	16.4
Area of Residence		
Central	185	84.1
Eastern	8	3.6
Northern	5	2.3
Southern	9	4.1
Western	13	5.9
Monthly Income in SAR		
Less than 3000	71	32.3
3000-5500	40	18.2
5550-15000	47	21.4
15050-25000	33	15.0
More than 25000	29	13.2
Education		
Bachelor	144	65.5
Diploma	10	4.5
High School	35	15.9
Master	22	10.0
PhD	9	4.1

Table 2 outlines the usage of social networking. Noticeably, a preponderance of the sample spent more than 2 hours daily on social media (72.3%) and 33.2% used 3 social media platforms. Nearly 80% of the participants followed influencers and celebrities on social media, whereas only 37.3% followed active dentists and dental clinics on social media. The social media platforms with the most veneers/lumineers advertisements were Snapchat, subsequently Instagram (Figure 1).

Table 3 displays the participants' tendency to choose veneers/lumineers based on their social media daily exposure. Of the group (88.8%) who did not have veneers or lumineers, the majority were in the group exposed to social media networks, exceeding 2 hours a day, with 25% in the ≤ 2 hours a day. Of the 11.8% who had veneers or lumineers, 9.09% spent more than 2 hours, and 2.7% spent ≤ 2 hours daily on social media (p=0.573).

Table 2 Participants' Patterns of Social Networking Usage

Characteristic	Frequency (n=242)	%
Number of Social Media networks Used		
1	18	8.2
2	22	10.0
3	73	33.2
4	67	30.5
5	40	18.2
Numbers of Hours of Daily Use		
≤2	61	27.7
>2	159	72.3
Following Influencers/Celebrities on Social Media		
No	44	20
Yes	176	80
Following Active Dentists/Dental Clinics on Social Media		
No	138	62.7
Yes	82	37.3

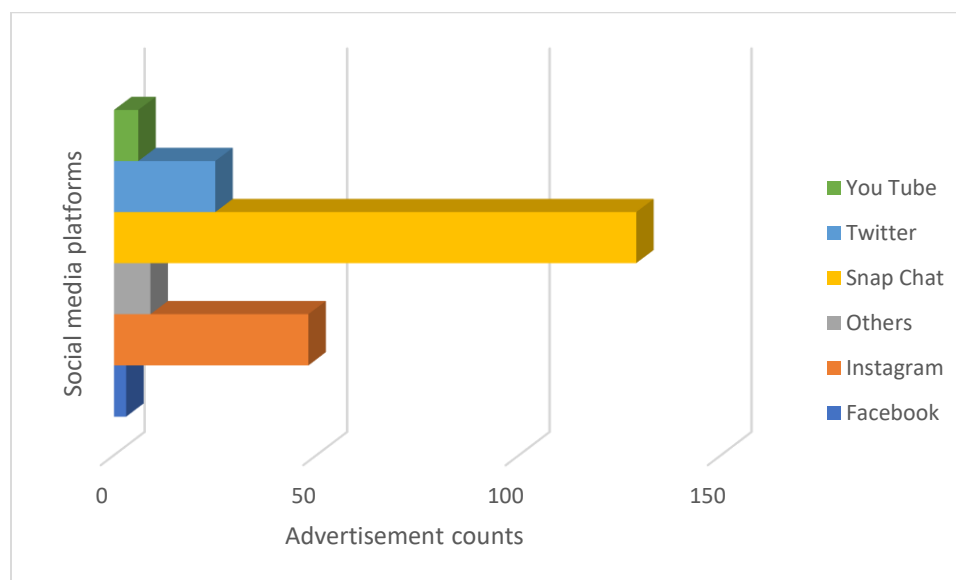

Figure 1 Bar chart view depicting social media networks with the most veneers/Lumineers advertisements

Table 3 Tendency to Choose Veneers/Lumineers Based on Their Social Media Daily Exposure

		Participants' Daily Hours on Social Media		Total n(%)	p-value
		≤2 Hours n(%)	>2 Hours n(%)		
Have you ever had Veneers/Lumineers?					
	No	55(25)	139(63.18)	194(88.18)	0.573
	Yes	6(2.7)	20(9.09)	26(11.8)	
Participants Without Veneers/Lumineers	Are you considering veneers in the future?				
	No	40(20.6)	99(51.03)	139(71.6)	0.834
	Yes	15(7.7)	40(20.6)	55(28.35)	
	Are you considering lumineers in the future?				
	No	38(20.1)	108(55.67)	146(75.2)	0.210
	Yes	17(8.7)	31(15.9)	48(24.7)	

	Can social media influence your decision to have Veneers/Lumineers in the future?				
	No	35(18.04)	65(33.5)	100(51.5)	0.034*
	Yes	20(10.3)	74(38.1)	94(48.45)	
Participants with Veneers/Lumi neers	Did social media influence your decision to have Veneers/Lumineers				
	No	2(7.69)	13(50)	15(57.69)	0.347
	Yes	4(15.38)	7(26.9)	11(42.3)	
	If yes, are you satisfied with your treatment?				
	Neutral	10(4.5)	24(10.9)	34(15.45)	0.915
	No	35(15.9)	89(40.45)	124(56.36)	
	Yes	16(7.27)	46(20.9)	62(28.18)	

*p-value was based on Pearson's chi-squared test/ Fisher's exact tests to evaluate the Participants' Tendency to Choose Veneers/Lumineers (Yes/ No) and daily exposure to social media

A small proportion (7.7%) of the group that used social media for ≤ 2 hours a day and 20.6% of the group that used social media for > 2 hours daily agreed to consider veneers in the future. Less than a third (20.6%) of the group that used social media for ≤ 2 hours a day and 51% of the group that used social media for > 2 hours daily did not agree to consider veneers in the future ($p=0.834$). The difference was not significant for the choice of having lumineers in the future ($p=0.22$). Almost half (48.45%) of the participants that did not have veneers or lumineers agreed that social media could influence their decision to have veneers and lumineers in the future, and 51% did not agree. A significant association was found between the hours of exposure to social networking and the likelihood to consider social networking to influence the treatment decision for veneers and lumineers ($p=0.034$). However, the association was not significant for the group who already had veneers or lumineers ($p=0.199$).

The association between the tendency to seek veneers or lumineers after a social media influencer advertisement was not significantly associated ($p=0.071$). Also, trusting in the credibility of these advertisements was not significantly associated with the impact of social media ($p=0.139$) (Table 4). However, the association was significant when the advertisers were dental professionals ($p<0.001$) (Table 5).

Table 4 The effect of social media influencers on the selection of the advertised treatment

Question	Participants Follow Influencers on Social Media		Total n(%)	p-value
	No n(%)	Yes n(%)		
Tendency to seek veneers/lumineers treatment after a social media influencer advertisement				
Neutral	9(4.09)	59(26.8)	68(30.9)	0.071
No	30(13.6)	86(39.09)	116(52.7)	
Yes	5(2.27)	31(14.09)	36(16.36)	
Trust the credibility of veneers/lumineers advertisements done by social media influencers				
Neutral	7(3.18)	54(24.5)	61(27.7)	0.139
No	34(15.45)	110(50)	144(65.45)	
Yes	3(1.36)	12(5.45)	15(6.8)	

Table 5 Selection of advertised treatment on social media networks by the subgroup following dentists or dental clinics on social media

Question	Participants Follow dentists/dental clinics on Social Media		Total n(%)	p-value
	No n(%)	Yes n(%)		
Tendency to seek veneers/lumineers treatment after a dentists/dental clinic advertisement				
Neutral	32(14.5)	22(10)	54(24.5)	< .001*
No	78(35.45)	23(10.45)	101(45.9)	
Yes	28(12.7)	37(16.8)	65(29.5)	

Trust the credibility of veneers/lumineers advertisements done by a dentists/dental clinic on social media				
Neutral	40(18.18)	33(15)	73(33.18)	< .001*
No	85(38.6)	29(13.18)	114(51.8)	
Yes	13(5.9)	19(8.6)	32(14.5)	

Logistic regression analyses were conducted to see the association of potential predictors including gender, age, region of residence, education, monthly income on the influence of social networking to choose veneers and lumineers. The overall model fit was $R^2 = 0.09$. None of the predictors contributed significantly to the outcome ($p > 0.05$).

4. DISCUSSION

The current study revealed that even though social media had a great influence to seek veneer and lumineer treatments, the type of social media influencer had a significant effect on this tendency. The time spent on social media significantly influenced the decision to have veneers or lumineers as treatment in the group not exposed to such treatment before. However, this was not significant with the group that already had veneers or lumineers.

Our findings revealed, Snapchat and Instagram were the most visited platform, which is on par with the literature (Alghamdi and Bogari, 2020; Alhabash and Ma, 2017). The global use of digital devices has increased markedly with the COVID-19 pandemic (Pandya and Lodha, 2021). People were forced to rely on digital platforms and change from offline to online (Pandya and Lodha, 2021). A study done in 2013 established the relationship between cosmetic procedures and media (Lazar and Deneuve, 2013). With the surge of social media, more people, especially females, want to enhance their aesthetic appearance. A beautiful or a “celebrity” smile plays a significant role in achieving that goal. This is true for other types of cosmetic surgeries as well, there is also an increasing number of young women having cosmetic procedures (Walker et al., 2021). As a result, social media networks are saturated with dentists and dental clinic accounts and advertisements, underpinning the need to examine the effects of these advertisements on the provision of veneers and lumineers treatment.

Our study showed that social media advertisements could affect an individual’s decision to seek such treatments in future. Almost half (48.45%) of the group without veneers and lumineers responded positively to the question ($p = 0.034$). In addition, 42.3% of the group with veneers and lumineers treatment stated that advertisements played a part in their decision to have the treatments. The tendency to seek such treatment and the credibility increased if the advertisement was done by a dentist/dental clinic. The latter finding is in line with a study by Alalawi et al., (2019) stating that participants sometimes choose their dentists based on their social media accounts. Health professionals have a distinctive responsibility and an ethical obligation to correct misconceptions in the beliefs and health information by their expertise as well as obligations. As such, they are under obligation to share truthful health information and direct people to reliable sources of health information within their communities and spheres of influence (Wu and McCormick, 2018). With the increase in awareness, a large and growing majority of Internet users are concerned about the quality of online health information which may be contributing to our finding (Cline and Haynes, 2001).

The current study found that 88.18% of the participants have not had veneers and lumineers treatments, of this group 24.7% consider the possibility in the future. This percentage agrees with the Al Fouzan et al., (2018) study, reporting that cost is a factor in limiting people from seeking these treatments and the notion of overuse in the community. Our findings revealed a significant relationship between time spent on social media and the influence of social media on choosing veneers and lumineers in participants who did not have veneers or lumineers ($p = 0.034$). However, the association was not significant for the group who already had veneers or lumineers ($p = 0.199$). This may be imputed to the fact that the group who had already the treatment knows the pros and cons of the procedures. Having practical exposure and knowledge leads to a deeper understanding of the concept through personal experience. The group without a veneer or a lumineer may gain theoretical knowledge through social media but practical experience provides a more in-depth review of the facts.

The foremost limitation of our study is the convenient sample hence generalization of the results may not be appropriate. Moreover, skewed distribution of age groups, region of residency, monthly income, education level, and gender is another limitation of this study. Additional research is required with an appropriate sampling technique and study design to evaluate the role of social media advertisements in the decisions made by patients related to cosmetic treatment in dentistry. The findings of this study, despite the limitations, highlight the fact that social media networks should be methodically customized to end users’ priorities to uplift the literacy-related to cosmetic dentistry.

5. CONCLUSION

Within the limits of this study, social media had a substantial influence on the tendency to seek veneer and lumineer treatments and the type of social media influencer had a significant effect on this tendency. The time spent on social media significantly influenced the decision to have a veneer or lumineers as treatment in the group not exposed to such treatment before. The outcomes of this study may guide the Saudi authorities to establish regulations regarding social media advertisements that protect the patients' level of knowledge related to dental veneers and lumineers.

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Author Contributions

All authors equally contributed to this study.

Ethical approval

The study was approved by the Medical Ethics Committee of King Abdullah International Medical Research Center (Study number: RC20/331/R).

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Conflicts of interest

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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